

LEGEND

POST-OROGENIC GRAVELS

QUATERNARY

PLEISTOCENE AND HOLOCENE

Q Fluvial and glaciofluvial gravels, diamictite, scattered erratics, minor peat (mapped only where the nature of bedrock cannot be inferred).

NEOGENE AND QUATERNARY

PLIOCENE AND PLEISTOCENE

TBQ 'BRASKERUDS' beds and glaciofluvial drift, undivided (see also Note 6): Sand, fine- to coarse-grained; quartzose, unconsolidated, cross-stratified; silt; gravel; minor uncoaled wood, leaves, peat, mud; fluvial, swamp and lacustrine deposits; unconformably overlain by unconsolidated or locally cemented glaciofluvial gravels, diamictite and scattered erratics; **periglacial**.

SVERDRUP BASIN SUCCESSION

PALEOGENE

EUREKA SOUND GROUP (TMBL-TM)

TM MARGARET FORMATION (Upper Paleocene-Eocene): sandstone, quartzose, fine- to medium-grained; yellowish orange and pale yellowish grey weathering; lignite, locally fused and stained red; siltstone; minor mudrock; **deltaic and nonmarine**.

TSL 'SPLIT LAKE' beds (TSL; Upper Paleocene-Upper Eocene): conglomerate, pebble to boulder size with granitoid gneiss clasts; arkose-quartz sandstone; minor siltstone, shale, and coal; T.u. unnamed carbonate clast conglomerate; minor sandstone; **alluvial fan**.

TMM MOUNT MAORE FORMATION (Upper Paleocene): sandstone, quartzose, variably calcite-cemented or uncemented; cross-stratified; abundant to moderate yellow brown, greyish yellow and greyish orange weathering; abundant detrital coal fragments; siltstone; marl; mudrock; minor conglomerate; **deltaic and nearshore marine**.

TMBL MOUNT BELL and MOUNT LAWSON FORMATIONS, undivided (Upper Paleocene, possible Maastrichtian at base): mudrock, with intercalated and thin-bedded lithic and volcanogenic sandstone and siltstone; moderate to dark brownish grey weathering; minor lignite coal; abundant silicified wood; basal thin unit of sandstone, quartzose, cross-stratified, white to dark yellowish orange weathering; lignite coal; **fluvial and marginal marine** (See also Note 5).

FRANKLINIAN SUCCESSION

DEVONIAN

OKSE BAY GROUP (DSF-DHG)

UPPER DEVONIAN

DHG HELL GATE FORMATION (Frasnian). Sandstone, minor siltstone, and coal. Sandstone: yellow to orange weathering; fine- and medium-grained; medium- and thick-bedded, trough and planar cross-stratified, scattered pebbles, shale-chip conglomerate. Siltstone: green and red weathering; thin-bedded, recessive; **braided fluvial**.

DF FRAM FORMATION (Frasnian). Sandstone and siltstone. Sandstone: locally calcareous; dusky red and white weathering; fine-grained; thick- to thin-bedded, abundant trough cross-stratification; common fining- and coarsening-upward sequences. Siltstone: calcareous dusky red and green weathering; thin-bedded; **meandering fluvial**.

MIDDLE DEVONIAN

DHB HECLA BAY FORMATION (Givetian). Sandstone: rare chert pebbles; pale yellowish orange and yellowish grey weathering; fine- to medium-grained; thick-bedded; planar and trough cross-stratified; **braided fluvial**.

LOWER AND MIDDLE DEVONIAN

DSF STRATHCONA FIORD FORMATION (Emsian and Eifelian). Sandstone, siltstone, mudrock, minor conglomerate, and limestone. Sandstone: quartzose, micaceous and calcareous; dusky red and yellowish green weathering; thin- to thick-bedded, abundant cross-stratification. Siltstone and mudrock: micaceous; dusky red weathering; thin-bedded, planar-parallel and cross-stratified, mudcracks. Conglomerate: yellowish grey; pebble and granule grade; thick-bedded. Limestone: light brown weathering, thin-bedded; abundant crinoids; **meandering, braided fluvial, marine**.

LOWER DEVONIAN

DBLu BLUE FIORD FORMATION (Emsian) (See also Note 4)
Members 2 and 3 (undivided):
Member 3. Dolostone and limestone: yellow and yellowish brown weathering; thick-bedded, fenestral; vuggy porosity locally; fossiliferous to unfossiliferous; **open shelf**.
Member 2. Dolostone, limestone, siltstone, minor gypsum and anhydrite. Limestone and dolostone: silty; dusky red and pale yellowish green weathering; thin-bedded; recessive. Siltstone: dusky red and yellowish green weathering; thin-bedded; planar, parallel lamination, ripple marks. Gypsum and anhydrite: white and red weathering; nodular and laminated; **restricted marine, paralic, floodplain**.

DBLI Member 1. Limestone, minor dolostone and sandstone. Limestone and dolostone: yellowish grey weathering; medium- to thick-bedded, bioturbated; abundant fossils; locally fenestral, biostromal, and biohermal. Sandstone: calcareous, pale yellowish brown and dusky yellow weathering; thin-bedded, massive; **open shelf**.

Dv VENDOM FIORD FORMATION (Emsian): Dolostone, conglomerate, gypsum, rare sandstone and siltstone. Dolostone: variably arenaceous, dusky red, yellowish green, and yellowish brown weathering; thin- to thick-bedded; rare skeletal fragments; mottled porosity. Sandstone: dusky red and pale yellowish brown weathering; locally cross-stratified. Siltstone: gypsiferous locally; moderate red and yellow-grey weathering; thin-bedded, recessive. Conglomerate: yellowish grey weathering, granule to cobble, rarely boulder, size; thick-bedded. Gypsum: white, orange and red weathering; planar-parallel lamination and nodular; **restricted shallow marine sediments, locally hypersaline; alluvial fan deposits** (see also Notes 3 and 7).

SILURIAN AND DEVONIAN

UPPER SILURIAN AND LOWER DEVONIAN

SDG GOOSE FIORD FORMATION (Ludlow to Pragian). Dolostone, limestone, minor sandstone. Dolostone: light grey, yellowish grey, and pale yellowish brown weathering; thin- to thick-bedded, resistant; locally very fossiliferous. Limestone: yellowish grey and pale yellowish brown weathering; thick- to medium-bedded; abundant brachiopods, corals, and stromatoporaes; numerous chert nodules, silicified trilobites and atrypids in basal part of formation; locally common stromatopora-coral bioherms and biostromes. Sandstone: yellowish grey weathering; fine-grained; thick- to medium-bedded; cross-stratified and massive; **restricted and open marine**.

SILURIAN

UPPER SILURIAN

SD DOURO FORMATION (Ludlow). Limestone: locally argillaceous and dolomitic; yellowish grey, pale yellowish brown, and pale yellowish green weathering; thick- and medium-bedded, locally burrow-mottled; abundant atrypid brachiopods and corals; rare coral-sponges bioherms; **open marine**.

SCS CAPE STORM FORMATION (Ludlow). Dolostone: minor silt; light grey and yellowish grey weathering; medium-bedded; planar-parallel lamination, abundant silicified mudcracks; **restricted marine**.

ORDOVICIAN AND SILURIAN

UPPER ORDOVICIAN TO UPPER SILURIAN

OSA ALLEN BAY FORMATION (Katian to Ludlow?)
Upper part. Limestone: dolomitic; yellowish grey; very thick-bedded; bioturbation structures; domal and laminar stromatolites, rare brachiopods; **restricted and open marine**.
Middle part. Dolostone: locally abundant silicification; yellowish grey and pale yellowish brown weathering; thick-bedded; abundant vuggy and bioturbated porosity; bitumen stained locally; abundant pentamerid brachiopods, stromatoporaes, corals, and crinoids; rare stromatopora-coral biostromes; **open marine**.
Lower part. Limestone: dolomitic; light grey and yellowish grey weathering; thick-bedded, burrow-mottled; sparsely fossiliferous; **open marine**.

ORDOVICIAN

CORNWALLIS GROUP (OCb-OCt)

UPPER ORDOVICIAN

OCt THUMB MOUNTAIN and IRENE BAY FORMATIONS (undivided)
IRENE BAY FORMATION (Katian): Limestone and minor mudrock. Limestone: argillaceous; pale greenish yellow and yellowish grey weathering; medium-bedded; rubbly weathering; abundant trilobite fragments, receptaculitids, corals, brachiopods, bryozoans, crinoids, and cephalopods. Mudrock: calcareous; pale greenish yellow weathering; thin-bedded; limestone nodules; **open marine**.
THUMB MOUNTAIN FORMATION (Sandbian to Katian): Limestone: dolomitic; light grey and yellowish grey weathering; thick-bedded; burrow mottled; rare crinoid ossicles, corals, gastropods (Maclurites), and cephalopods; white chert nodules in upper part; **open marine**.

LOWER TO UPPER ORDOVICIAN

OCb BAY FIORD FORMATION (Foliao to Sandbian)
Upper part. Dolostone: greyish green and yellowish grey weathering; thin-bedded; abundant planar-parallel lamination; rare mudcracks; **restricted marine**.
Middle part. Limestone and minor dolostone. Dolostone: as in upper part. Limestone: dolomitic; pale yellowish brown; thick-bedded; burrow mottled and locally fenestral; petrolierous, sparse fossils, including fragmentary and disarticulated trilobites, gastropods, crinoids, and brachiopods; **open marine**.
Lower part. Limestone, dolostone, mudrock, locally abundant gypsum and/or breccia at the base. Dolostone and limestone: light grey, pale yellowish green, and yellowish grey weathering; thin- to medium-bedded; abundant planar-parallel lamination. Mudrock: calcareous and locally gypsiferous; light grey weathering; fissile, friable. Gypsum: white weathering; planar-parallel laminated; intensely limestone. Breccia: particulate rubble packbreccia; poorly sorted; angular dolostone and limestone lithoclasts; **restricted marine**.

LOWER ORDOVICIAN

OE ELEANOR RIVER FORMATION (Tremadoc and Foliao): Limestone and dolostone. Limestone: dolomitic; pale yellowish brown and light grey weathering; thick-bedded; massive and burrow mottled; abundant chert nodules and silicified mottles. Dolostone: light grey weathering; thin- to medium-bedded; planar-parallel lamination and mudcracks; **restricted and open marine**.

OB BAUMANN FIORD FORMATION (Tremadoc)
Upper part. Limestone and gypsum. Gypsum: as in upper part. Limestone: yellowish grey weathering; thin-bedded; recessive; **restricted marine**.
Middle part. Limestone: dolomitic; yellowish grey weathering; thick-bedded; burrow mottled; resistant; **open marine**.
Lower part. Gypsum: white and light grey weathering; planar-parallel lamination; intensely tectonized; recessive; **restricted marine**.

Oce CHRISTIAN ELV FORMATION (Tremadoc): Limestone, minor dolostone and sandstone. Limestone and dolostone: medium grey and dark grey weathering; medium- to thick-bedded; numerous intraclast beds; rare algal-microbial mounds. Sandstone: calcareous; white and light grey weathering; medium- to thick-bedded; medium-grained; cross-stratified; **open and restricted marine**.

CAMBRIAN AND ORDOVICIAN

UPPER CAMBRIAN AND LOWER ORDOVICIAN

COCC CAPE CLAY FORMATION (Trempealeau to Tremadoc): Limestone and dolostone: yellowish brown and brownish orange weathering in the east, dark grey and dark yellowish brown in the west; thick-bedded; burrow mottled and abundant stromatolite-microbial boundstone; vuggy porosity; **open marine** (map unit is included with CASS FIORD FORMATION on all structure sections).

CAMBRIAN

MIDDLE AND UPPER CAMBRIAN

CCFu CASS FIORD FORMATION
Upper part. Limestone, minor dolostone, mudrock and sandstone. Limestone and dolostone: yellowish grey and greyish yellow-green weathering; thin- to thick-bedded; abundant algal-microbial mounds and intraclast beds; abundant fossils including fragmentary trilobites and brachiopods. Sandstone: quartzose and calcareous; white and yellowish grey; medium-bedded; locally with carbonate intraclasts and ooids. Mudrock: greyish yellow-green weathering; thin-bedded; **open and restricted marine**.

CCFJ Lower part. Limestone, dolostone, sandstone, siltstone, minor mudrock. Limestone and dolostone: variably silty and sandy; pale yellowish orange and red weathering; thick-bedded; abundant intraclast beds, cross-stratification, and planar-parallel lamination; rare fossils including fragmentary trilobites and brachiopods. Mudrock and siltstone: red weathering; thin-bedded; recessive; planar-parallel lamination, mudcracks; **restricted marine**.
Thickness variations of parts of this formation illustrated on the accompanying structural cross-sections are based on measured sections west of the map area and on northeastern Ellesmere Island.

LOWER AND MIDDLE CAMBRIAN

CCU CAPE LEIPER, CAPE INGERSOLL, POLICE POST, CAPE KENT AND CAPE WOOD FORMATIONS (undivided): Dolostone and limestone: variably argillaceous, arenaceous, peloidal, and oolitic; pale yellowish orange, greyish yellow, and yellowish brown weathering; medium- to thick-bedded; rare and light grey weathering; locally abundant trilobite fragments; vuggy porosity with local bitumen stain; **open and restricted marine**.

LOWER CAMBRIAN

CDB DALLAS BAY FORMATION: Sandstone: quartzose, locally arkosic and argillaceous, dolomitic in the upper part; yellowish grey and greenish grey weathering; thin- to thick-bedded; abundant horizontal and vertical (Skolithos) traces; **marine**.

INGLEFIELD MOBILE BELT

P PALEOPROTEROZOIC (~1980 to 1750 Ma; Dawes, 2004)
Gneiss, diverse meta-igneous and metasedimentary rocks, and granitoid rocks, chiefly of granulite grade; intrusive granitoid rocks (undivided; see GSC Memoir 409 by T. Frisch, 1988 for details). This unit may include unconformable sedimentary successions of Mesoproterozoic and Neoproterozoic ages where it is overlain by the Ellesmere Group in the subsurface (as illustrated on structural cross-sections).

CCF CASS FIORD FORMATION (Undivided).

CSB SCORESBY BAY FORMATION (structural cross-sections only): Dolostone and limestone: thickness variation, distribution, and contained rock types in this unit are based on measured sections and stratigraphic relationships documented on northeastern Ellesmere Island.

ECE EDIACARAN(?) AND LOWER CAMBRIAN
ELLESMEERE GROUP (undivided, structural cross-sections only): thickness variation, subsurface distribution, and contained rock types in this succession are extrapolated from seismic profiles of Bjorne Peninsula, and based on measured sections and stratigraphic relationships documented on northeastern Ellesmere Island. Separately mapped units of northeastern Ellesmere Island include the ARCHER FIORD FORMATION at the base (sandstone, slate, argillaceous limestone), and the overlying RITTER BAY (slate), RAWLINGS BAY (quartz sandstone) and KANE BASIN (slate and argillaceous limestone) FORMATIONS.

CCF CASS FIORD FORMATION (Undivided).

CSB SCORESBY BAY FORMATION (structural cross-sections only): Dolostone and limestone: thickness variation, distribution, and contained rock types in this unit are based on measured sections and stratigraphic relationships documented on northeastern Ellesmere Island.

ECE EDIACARAN(?) AND LOWER CAMBRIAN
ELLESMEERE GROUP (undivided, structural cross-sections only): thickness variation, subsurface distribution, and contained rock types in this succession are extrapolated from seismic profiles of Bjorne Peninsula, and based on measured sections and stratigraphic relationships documented on northeastern Ellesmere Island. Separately mapped units of northeastern Ellesmere Island include the ARCHER FIORD FORMATION at the base (sandstone, slate, argillaceous limestone), and the overlying RITTER BAY (slate), RAWLINGS BAY (quartz sandstone) and KANE BASIN (slate and argillaceous limestone) FORMATIONS.

